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Hyperbranched polyesterpolyols as components of amperometric monoamine oxidase biosensors based on electrodes modified with nanomaterials for determination of antidepressants

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Abstract

© 2017, Pleiades Publishing, Ltd.The use of hyperbranched polyesterpolyols of different generations favors firmer fixation of carbon nanotubes and silver nanoparticles as components of composite materials on the electrode surface (0.028 mg cm–2), which improves the operation characteristics of monoamine oxidase biosensors. The size of silver nanoparticles (18–52 nm) depends on the conditions for preparing hyperbranched polyesterpolyols, and their use as electrode modifiers influences the analytical possibilities of amperometric biosensors. Silver nanoparticles (18 nm, data of atomic force microscopy) in polyesterpolyols of third generation (pH 10.0) as components of the developed biosensors extend the interval of determinable concentrations to 1 × 10–4–1 × 10–8 M and decrease the lower limit of determination to 3 × 10–9 M, compared to the unmodified sensors, owing to enhancement of the analytical signal. The developed biosensors were tested in monitoring of drugs (antidepressants) in Coaxil and Auroriks drug forms with the relative standard deviation on the level of 0.052.

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